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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/802,010

Applicant(s)

CHUNG ET AL.

Examiner

JARED I. RUTZ

Art Unit

2187

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8-15 and 17-21 is/are rejected.
- 7) ☒ Claim(s) 7 and 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

1. Claims 1-21, as amended on 2/26/2008, are pending in the instant application. The Finality of the Office action of 4/3/2008 has been withdrawn as a courtesy to Applicant. Applicant's submission dated 6/6/2008 has been entered and carefully and fully considered, but is not found persuasive. Accordingly, the instant Office action is made **FINAL**.

Withdrawal of Finality of Previous Office Action

2. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. **Claims 2, 12, and 20** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

5. **Claims 2 and 12** recite the limitation *"wherein the meta-information is written after the data of the logical block is written."*

6. **Claim 20** recites the limitation *"wherein the meta-information is written in the spare area after the data of the logical block is written in the main area"*.

7. The Examiner is not aware of a portion of the specification which teaches how the meta-information is written after the data of the logical block is written. Accordingly, one of ordinary skill in the art would not know how to make or use the invention as recited in claims 2, 12, and 20.

8. Paragraph 04-05 of the specification states:

a. [04] In such a flash memory, data stored at specific locations can be randomly accessed in the same manner as existing RAMs, nonvolatile storage devices, magnetic devices or the like. **However, when data is modified or deleted, the data is accessed on a block basis contrary to existing storage devices.**

b. [05] That is, in the flash memory, **access is gained based on the block which written data is retrieved from or data is written in at once during read/write operations**, and based on a unit which comprises a plurality of blocks and can be erased through one delete operation. As a method of efficiently managing data according to the access characteristics of the flash memory, a block (of sector) re-mapping scheme has been generally used.

9. The Examiner notes that this section shows that the basic write unit in the flash memory disclosed in the specification of the instant application is called a block.

Paragraph 51 states that the main area 110 and the spare area 130 are part of the same block. Further, claims 1, 11, and 18 require that the meta-information and data are written in the same block. Accordingly, it would require the ability to perform a write smaller than what is disclosed to be the write unit to perform the limitations of claims 2, 12, and 20. Such an ability is not disclosed by the specification of the instant application.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. **Claims 1, 3-4, 11, 13-14, 18-19, and 21** are rejected under 35 U.S.C. 102(b) as being anticipated by Conley (US 2002/0099904).

12. **Claim 1** is taught by Conley as:

c. *A flash memory access apparatus, comprising: a flash memory comprising a plurality of units, each of the units comprising a plurality of blocks, and a flash memory controller.* Paragraph 0038 teaches the architecture of a typical non-volatile data storage system, which includes a controller and a plurality of flash memory devices. Paragraph 0040 explains that flash memory cells are divided into multiple pages.

- d. *Wherein if a write operation is requested for a logical block number of the flash memory, the flash memory controller is configured to write data and meta-information in a physical block corresponding to a logical block with the logical block number if a previous write operation has not been performed for the logical block.* Paragraph 0062 discusses a method of programming a non-volatile memory. If there are pages in the physical block that have not been written to, the data is written to those blocks.
- e. *And the flash memory controller is configured to perform a write operation for writing the data and the meta-information allocated to the logical block in a new physical block without changing flash memory state information, wherein the flash memory state information is written in a previous physical block corresponding to the logical block if the previous write operation has been performed for the logical block.* Paragraph 0049 shows that when new data is to be written to a logical block corresponding to physical block PBN 0, item 35 of figure 8, which is full, a new physical block PBN 1, item 39 of figure 8, is selected and the new pages are written to PBN 1. Figure 8 also shows that original block PBN0 contains timestamps 43 and LBN and page tag 41 for each page in the original block. Paragraph 0055 shows that an individual page contains data, item 45 of figure 10, and meta-information, item 49 of figure 10. Paragraph 0048 shows that when new pages are written to a logical block, the pages containing the original data are not tagged. The last sentence of paragraph 0047 further

emphasizes this by stating *"the writing of the old/new or other flags, as described with respect to FIGS. 6, 7A and 7B, cannot be tolerated."*

f. *And wherein the flash memory state information is time independent.*

Paragraph 0051 shows that the output of a modulo-N counter can be used to generate the value of field 43, which is shown in paragraph 0052 to be used to determine if a block is the most recent block.

13. **Claim 3** is taught by Conley as:

g. *The apparatus as claimed in claim 1, wherein the data and meta-information of the logical block are simultaneously written.* Paragraph 0055 shows that the data 45 and meta-information 49 are part of the same page. As the data and meta-information are part of the same page they would inherently be written simultaneously, as the system of Conley writes data on a page basis.

14. **Claim 4** is taught by Conley as:

h. *The apparatus as claimed in claim 1, wherein the meta-information comprises the logical block number.* Paragraph 0055 shows that overhead data, item 49 of figure 10, contains the logical block number.

i. *And the flash memory state information indicating a state of the physical block as valid, deleted, or invalid.* Paragraph 0055 shows a page contains a time stamp 43, paragraph 0051 shows that the timestamp can be replaced with the output of a modulo-N counter. Paragraph 0050 shows that the time stamp

indicates the time the page was written relative to other pages with the same logical address. As shown in paragraph 0052, the time stamps of blocks having the same logical block address and page offset are compared, which allows the system to determine which page is the last written page. Accordingly, this shows what pages are valid.

15. **Claim 11** is taught by Conley as:

j. *A flash memory access method, comprising: accessing the flash memory and searching for a currently writable physical block if a processor requests a write operation for a specific logical block number of the flash memory.*

Paragraph 0062 shows that when a write is performed, an available physical page is found.

k. *And writing data and meta-information in a physical block corresponding to a logical block with the logical block number if a previous write operation has not been performed for the logical block.* Paragraph 0062 discusses a method of programming a non-volatile memory. If there are pages in the physical block that have not been written to, the data is written to those blocks.

l. *And writing the data and the meta-information in a new physical block corresponding to the logical block without changing flash memory state information, wherein the flash memory state information is written in a previous physical block corresponding to the logical block if the previous write operation has been performed for the logical block.* Paragraph 0049 shows that when new

data is to be written to a logical block corresponding to physical block PBN 0, item 35 of figure 8, which is full, a new physical block PBN 1, item 39 of figure 8, is selected and the new pages are written to PBN 1. Figure 8 also shows that original block PBN0 contains timestamps 43 and LBN and page tag 41 for each page in the original block. Paragraph 0055 shows that an individual page contains data, item 45 of figure 10, and meta-information, item 49 of figure 10. Paragraph 0048 shows that when new pages are written to a logical block, the pages containing the original data are not tagged. The last sentence of paragraph 0047 further emphasizes this by stating *"the writing of the old/new or other flags, as described with respect to FIGS. 6, 7A and 7B, cannot be tolerated."*

m. *Wherein the flash memory state information is time independent.*

Paragraph 0051 shows that the output of a modulo-N counter can be used to generate the value of field 43, which is shown in paragraph 0052 to be used to determine if a block is the most recent block.

16. **Claim 13** is taught by Conley as:

n. *The apparatus as claimed in claim 11, wherein the data and meta-information of the logical block are simultaneously written.* Paragraph 0055 shows that the data 45 and meta-information 49 are part of the same page. As the data and meta-information are part of the same page they would inherently be written simultaneously, as the system of Conley writes data on a page basis.

17. **Claim 14** is taught by Conley as:

o. *The method as claimed in claim 11, wherein the meta-information comprises the logical block number.* Paragraph 0055 shows that overhead data, item 49 of figure 10, contains the logical block number.

p. *And the flash memory state information indicating a state of the physical block as valid, deleted, or invalid.* Paragraph 0055 shows a page contains a time stamp, paragraph 0051 shows that the timestamp can be replaced with the output of a modulo-N counter. Paragraph 0050 shows that the time stamp indicates the time the page was written relative to other pages with the same logical address. As shown in paragraph 0052, the time stamps of blocks having the same logical block address and page offset are compared, which allows the system to determine which page is the last written page. Accordingly, this shows what pages are valid.

18. **Claim 18** is taught by Conley as:

q. *A flash memory access apparatus, comprising: a flash memory comprising a plurality of physical blocks.* Paragraph 0038 teaches the architecture of a typical non-volatile data storage system, which includes a controller and a plurality of flash memory devices. Paragraph 0040 explains that flash memory cells are divided into multiple pages.

r. *Wherein each physical block of the plurality of physical blocks comprises data and meta-information, and the meta-information comprises a logical block number and flash memory state information.* Paragraph 0055 shows that each page contains an overhead data area 49, which includes the LBN and page tag 41 and time stamp 43, which is used to determine if the stored data is the valid data for the corresponding logical page. Figure 8 shows that original block PBN0 contains timestamp 43 and LBN and page tag 41 for each page in the original block.

s. *Wherein the flash memory state information is time independent.* Paragraph 0051 shows that instead of a timestamp, a modulo-N counter may be used which is incremented each time a logical block is updated.

t. *And a flash memory controller, wherein if a write operation is requested for the logical block number, the flash memory controller performs one of (a) a first write operation which writes the data and the meta-information in a first physical block corresponding to the logical block number, if the first write operation has not previously been performed for the logical block number, and changes the flash memory state information of the physical block corresponding to the logical block number.* Paragraph 0055 shows that each page contains overhead data 49. It is inherent that this data is written to the page when the first write is performed for the logical page number, as otherwise the system would be unable to tell if later written data is later or earlier.

u. *And (b) a second write operation which writes the data and the meta-information in a second physical block, if the first write operation has been performed for the logical block with the logical block number, wherein the flash memory state information of the physical block corresponding to the logical block number is not changed.* Paragraph 0049 shows that when new data is to be written to a logical block corresponding to physical block PBN 0, item 35 of figure 8, which is full, a new physical block PBN 1, item 39 of figure 8, is selected and the new pages are written to PBN 1. Paragraph 0055 shows that an individual page contains data, item 45 of figure 10, and meta-information, item 49 of figure 10. Paragraph 0048 shows that when new pages are written to a logical block, the pages containing the original data are not tagged. The last sentence of paragraph 0047 further emphasizes this by stating *"the writing of the old/new or other flags, as described with respect to FIGS. 6, 7A and 7B, cannot be tolerated."*

v. Additionally, the Examiner respectfully notes that that claim 18 only requires performing one of the first write operation and second operation.

19. **Claim 19** is taught by Conley as:

w. *The apparatus as claimed in claim 18, wherein each physical block comprises further comprises a main area which stores the data and a spare area which stores the meta-information, the logical block number and the flash*

memory state information. Figure 10 shows that each page contains user data area 45 and overhead area 49.

20. **Claim 21** is taught by Conley as:

x. *The apparatus as claimed in claim 19, wherein the meta-information is written in the spare area simultaneously as the data of the logical block is written in the main area*. Paragraph 0055 shows that the data 45 and meta-information 49 are part of the same page. As the data and meta-information are part of the same page they would inherently be written simultaneously, as the system of Conley writes data on a page basis.

Claim Rejections - 35 USC § 103

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. **Claims 5-6, 8-10, 15, and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Conley (cited *supra*) in view of Kim et al. (US 6,381, 176).

23. **Claim 5** is taught by Conley as shown *supra* with respect to claim 1.

24. Although Conley teaches that blocks having the same logical block number can be distinguished by their timestamps, it does not disclose expressly performing a recovery operation.

25. With respect to claim 5, Kim teaches:

y. *The apparatus as claimed in claim 1, wherein the flash memory controller is configured to perform a recovery operation which detects, during a scanning process, physical blocks for the logical block number and recovers from an error by determining a valid block for the logical block among the detected physical blocks.* Kim teaches at column 6 lines 29-36 that a recovery operation is required if two valid blocks having the same logical block number exist. In the system disclosed by Conley, paragraph 0050 shows that it can be determined which of multiple pages having the same logical block number and page offset is the correct page by comparing the timestamps of the blocks.

26. At the time of the invention it would have been obvious to one of ordinary skill in the art that a recovery operation is necessary in the event of an error during writing.

27. Conley and Kim are analogous art because they are from the same field of endeavor, the design of flash memory systems.

28. The motivation for doing so would have been to determine which block will be erased during a recovery operation (Kim, column 6 lines 30-36)

29. Therefore, it would have been obvious to combine Kim with Conley for the benefit of determining which pages are old and can be deleted to obtain the invention as specified in **claims 5, 6, and 8-10.**

30. **Claim 6** is taught by Conley as:

z. *The apparatus as claimed in claim 5, wherein the scanning process comprises reading a logical block number for each of the physical blocks by investigating the flash memory based on a latest accessed block.* Paragraph 0052 shows that when the controller reads the data, it compares the counts in fields 43 and 43' of pages having the same LBA and page offset.

aa. *And investigating a field of a block allocation table corresponding to the read logical block number.* Figure 9, discussed in paragraph 0049, which is formed from the data in fields 41 and 41', shows the table that provides a mapping from logical blocks to physical blocks.

31. **Claim 8** is taught by Conley as:

bb. *The apparatus as claimed in claim 5, wherein the recovery operation recovers from an error by determining a latest accessed physical block for the logical block number among the detected physical blocks according to priorities set during the scanning process, as the valid block.* Conley paragraph 0050 shows that the most recently written page is determined by checking field 43, the timestamp.

cc. *And rewriting flash memory state information written in other physical blocks of the detected physical blocks as deleted.* Paragraph 0062 shows that updating one or more blocks of data will result in one or more blocks storing the

data to be superceded by the new data, and the blocks with superceded data are identified for erasure.

32. **Claim 9** is taught by Conley and Kim as:

dd. *The apparatus as claimed in claim 5, wherein the recovery operation is performed during the initializing the flash memory.* Kim column 4 lines 22-25 shows that when a flash memory is initially used, a logical unit number to physical unit number table is provided. To generate such a table in a system using the timestamps of Conley, it would be necessary to determine which of the pages sharing the same logical block number and page offset is the most recent page.

33. **Claim 10** is taught by Kim as:

ee. *The apparatus as claimed in claim 5, wherein the recovering from the error is performed during reclaiming the flash memory wherein the reclaiming comprises moving data written in a predetermined unit of the flash memory to a new unit.* Column 8 line 55 to column 9 line 4 teaches that in a reclaim operation, valid blocks and related metadata are copied to a new unit. In order to determine which blocks are valid in a system using the timestamps of Conley, the timestamps of pages having the same logical block number and page offset must be compared.

34. **Claim 15** is taught by Conley as shown *supra* with respect to claim 11.
35. Although Conley teaches that blocks having the same logical block number can be distinguished by their timestamps, it does not disclose expressly performing a recovery operation.
36. With respect to claim 5, Kim teaches:
- ff. *The method as claimed in claim 11, further comprising a recovery operation comprising detecting, during a scanning process, physical blocks for the logical block number and of recovering from an error by determining a valid block for the logical block among the detected physical blocks.* Kim teaches at column 6 lines 29-36 that a recovery operation is required if two valid blocks having the same logical block number exist. In the system disclosed by Conley, paragraph 0050 shows that it can be determined which of multiple pages having the same logical block number and page offset is the correct page by comparing the timestamps of the blocks.
37. At the time of the invention it would have been obvious to one of ordinary skill in the art that a recovery operation is necessary in the event of an error during writing.
38. Conley and Kim are analogous art because they are from the same field of endeavor, the design of flash memory systems.
39. The motivation for doing so would have been to determine which block will be erased during a recovery operation (Kim, column 6 lines 30-36)

40. Therefore, it would have been obvious to combine Kim with Conley for the benefit of determining which pages are old and can be deleted to obtain the invention as specified in **claims 15 and 17**.

41. **Claim 17** is taught by Conley and Kim as:

gg. *The method as claimed in claim 15, wherein the recovering comprises recovering from the error by determining a latest data written among data of a specific logical block number detected during reclaiming the flash memory and wherein the reclaiming comprises moving data written in a predetermined unit of the flash memory to a new unit.* Conley paragraph 0050 shows that the most recently written page is determined by checking field 43, the timestamp. Kim column 8 line 55 to column 9 line 4 teaches that in a reclaim operation, valid blocks and related metadata are copied to a new unit. In order to determine which blocks are valid in a system using the timestamps of Conley, the timestamps of pages having the same logical block number and page offset must be compared.

Allowable Subject Matter

42. **Claims 7 and 16** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

43. Applicant's arguments filed 6/6/2008 have been fully considered but they are not persuasive.

44. First point of Argument

45. In the second paragraph beginning on page 3 of the reply submitted 6/6/2008, with respect to the rejection of claims 2, 12, and 20 under 35 USC 112 first paragraph, Applicant argues:

hh. *"The Examiner states that because the recording is performed in "block" units, with respect to the main region and the spare region existing in the same block, it is not possible to first record data in the main region, and then record meta information in the spare region. However, Applicant notes, referring to FIG. 6 and paragraph [0042] of Conley et al, it is disclosed that "An old/new flag 27 is written in each of the page 3-5 to indicate the data of those pages is old, while the flag 27 for the remaining pages 0-2, 6 and 7 remain set "new". That is, after recording pages 3-5 of the updated page on a new block 25, the flag of each page is recorded again without changing data of each page. Hence, considering the fact that the block includes a multiple of pages, it is not difficult to record in the unit 27 smaller than the block unit 21. Accordingly, Applicant submits that one of ordinary skill in the art would know how to write data to a flash memory in a unit smaller than a block."*

46. The Examiner respectfully disagrees. Paragraph 003 of Conley identifies a block as being the smallest number of cells that are erasable at one time, and paragraph

0004 identifies a page as being the basic unit for reading and programming data. As stated in MPEP 2111.01(IV), Applicant may be his or her own lexicographer. Paragraph 05 of the specification of the instant application states:

ii. *"That is, in the flash memory, access is gained based on the block which written data is retrieved from or data is written in at once during read/write operations, and based on a unit which comprises a plurality of blocks and can be erased through one delete operation. As a method of efficiently managing data according to the access characteristics of the flash memory, a block (or sector) re-mapping scheme has been generally used."*

47. Accordingly, Applicant has defined a block to be the basic write unit, and a plurality of blocks to be the erase unit. Accordingly, the blocks recited in the claims are not equivalent to the blocks of Conley (which are identified as erase units), but rather the pages of Conley. Conley does not teach how to write data that is smaller than the write unit. It is known in the art to overwrite data stored in a page, but such writes disturb the rest of the data stored in the page. Paragraph 0046 points out that writing the flags can also disturb data of other pages within the block that are current. In the prior art discussed in Conley, disturbing the data of the overwritten page is not an issue, as it is not valid data. However, in claims 2, 12, and 20 of the instant application, valid data is being written. How is the meta-information written after the data without destroying the data written in the logical block?

48. **Second point of Argument**

49. In the second through fourth paragraphs beginning on page 4 of the reply submitted 6/6/2008, with respect to the rejection of claims 1, 3, 4, 11, 13, 14, 18, 19, and 21 under 35 USC 102(b) as being anticipated by Conley, Applicant argues:

jj. "Independent claim 1 recites in part 'the flash memory controller is configured to perform a write operation for writing the data and the meta-information allocated to the logical block in a new physical block without changing flash memory state information, wherein the flash memory state information is written in a previous physical block corresponding to the logical block if the previous write operation has been performed for the logical block.' Independent claims 11 and 18 recite features similar to these of claim 1.

kk. On page 6 at item (e), the Examiner cites FIG. 8 and paragraph [0049] of Conley as allegedly disclosing this feature. However, referring to FIG. 8, Conley discloses some data of the logical block is recorded in a new physical block.

ll. On the other hand, according to the claimed invention, memory state information in a previous physical block is not changed, and all updated data of the logical block is recorded in a new physical block (see, for example, FIGS. 6, 7 and 8C of the present application). Specifically, referring to FIG. 8C, in the process of scanning, if the state value for LBN recorded in BAT is "1", deletion (D) is marked on the memory state information recorded in the auxiliary region of the currently-selected block, so it can be understood that all data of the logic block is stored in the same physical block."

50. The Examiner respectfully disagrees. As noted supra, the page recited in Conley is equivalent to the block recited in the instant application, as they are both the smallest write units. Conley teaches that the updated pages are written to new physical pages without changing the flash memory state information that is written in the previous physical page, and accordingly teaches the cited limitation of claim 1 as shown supra.

51. **Third Point of Argument**

52. In the fourth through fifth paragraphs beginning on page 5 of the reply submitted 6/6/2008, with respect to the rejection of claims 5, 6, 8-10, 15, and 17 under 35 USC 103(a) as being unpatentable over Conley in view of Kim, Applicant argues:

mm. "Claim 5 recites "the flash memory controller is configured to perform a recovery operation which detects, during a scanning process, physical blocks for the logical block number and recovers from an error by determining a valid block for the logical block among the detected physical blocks." Claim 15 recites similar features.

nn. Conley does not disclose a valid "block", but instead discloses a valid "page" within different blocks (see FIG. 8 of Conley). Further, Kim only discloses scanning of the block unit. Thus, the Examiner's proposed combination of Coley and Kim does not teach or suggest disclose all of the features of the claims."

53. The Examiner respectfully disagrees. As noted supra, the page recited in Conley is equivalent to the block recited in the instant application, as they are both the smallest write units. Kim teaches identifying valid blocks between multiple blocks having the same logical address based on wrap counts, see column 6 lines 30-41. Paragraph

0041 of Conley shows that the LBN to PBN translation table is typically stored in volatile memory. The Examiner maintains that it would have been obvious to one of ordinary skill in the art to use a recovery operation as taught by Kim to determine which pages are valid as shown supra with respect to claims 5 and 15, as such a recovery operation would be necessary to determine which physical pages are valid.

Conclusion

54. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JARED I. RUTZ whose telephone number is (571)272-5535. The examiner can normally be reached on M-F 9:00 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Ellis can be reached on (571)272-4205. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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